RADIO RECEIVING SETS AN/URR–29 AND R–644/URR AND RADIO RECEIVERS R–220/URR AND R–644/URR

TM 11–882
TO 31R2–2URR–161
CHANGES No. 1

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
WASHINGTON 25, D. C., *5 October 1956*

TM 11–882/TO 31R2–2URR–161, 7 November 1955, is changed as follows:

The title of the manual is changed to read: **RADIO RECEIVING SETS AN/URR–29 AND AN/URR–29X AND RADIO RECEIVERS R–220/URR AND R–644/URR.**

The following information changes TM 11–882/TO 31R2–2URR–161 so that the manual also applies to the following equipments:

Nomenclature	*Order No.*	*Serial No.*
Radio Receiving Set AN/URR–29X and Radio Receiver R–644/URR.	08714–Phila–55	1 and higher

Page 1, title. Change "RX220/URR" to read: **R–220/URR.**

Page 2, chapter 1. Add the following note at the beginning of chapter 1:

Note. Unless otherwise specified in this change, all references in the manual to Radio Receiving Set AN/URR–29, Radio Receiver R–220/URR, and Power Supply PP–660/URR apply equally to Radio Receiving Set AN/URR–29X, Radio Receiver R–644/URR, and Dynamotor DY–80/URR.

Page 2, paragraph 3, line 8. Insert the following after the end of the second sentence: In installations that have an alternating-current (ac) power source, Radio Receiving Set AN/URR–29 is used and in installations that have direct-current (dc) power sources, Radio Receiving Set AN/URR–29X is used.

Page 2, paragraph 3. Add the following note after paragraph 3:

Note. When Dynamotor DY–80/URR is used with Radio Receiver R–220/URR (par. 75.1*g*), the receiver nomenclature becomes Radio Receiver R–644/URR. When Power Supply PP–660/URR is used with Radio Receiver R–644/URR, the receiver nomenclature becomes Radio Receiver R–220/URR.

Page 3, figure 1. Make the following changes:
Add the following to the caption: early models.
Insert figure 1.1 after 1.

Page 5, paragraph 4. Make the following changes in paragraph 4:
Line 6. Change "Power supply" to read: **Power Supply PP–660/URR.**
Line 6. Add the following below line 6:
Dynamotor DY–80/URR ..... None.
Line 24 from bottom of page. Add the following after "Fm signals": (for 40-db signal-to-noise ratio).
Line 6 from bottom of page. Add the following after "Terminals 3 and 6": (with terminals 4 and 5 jumpered).

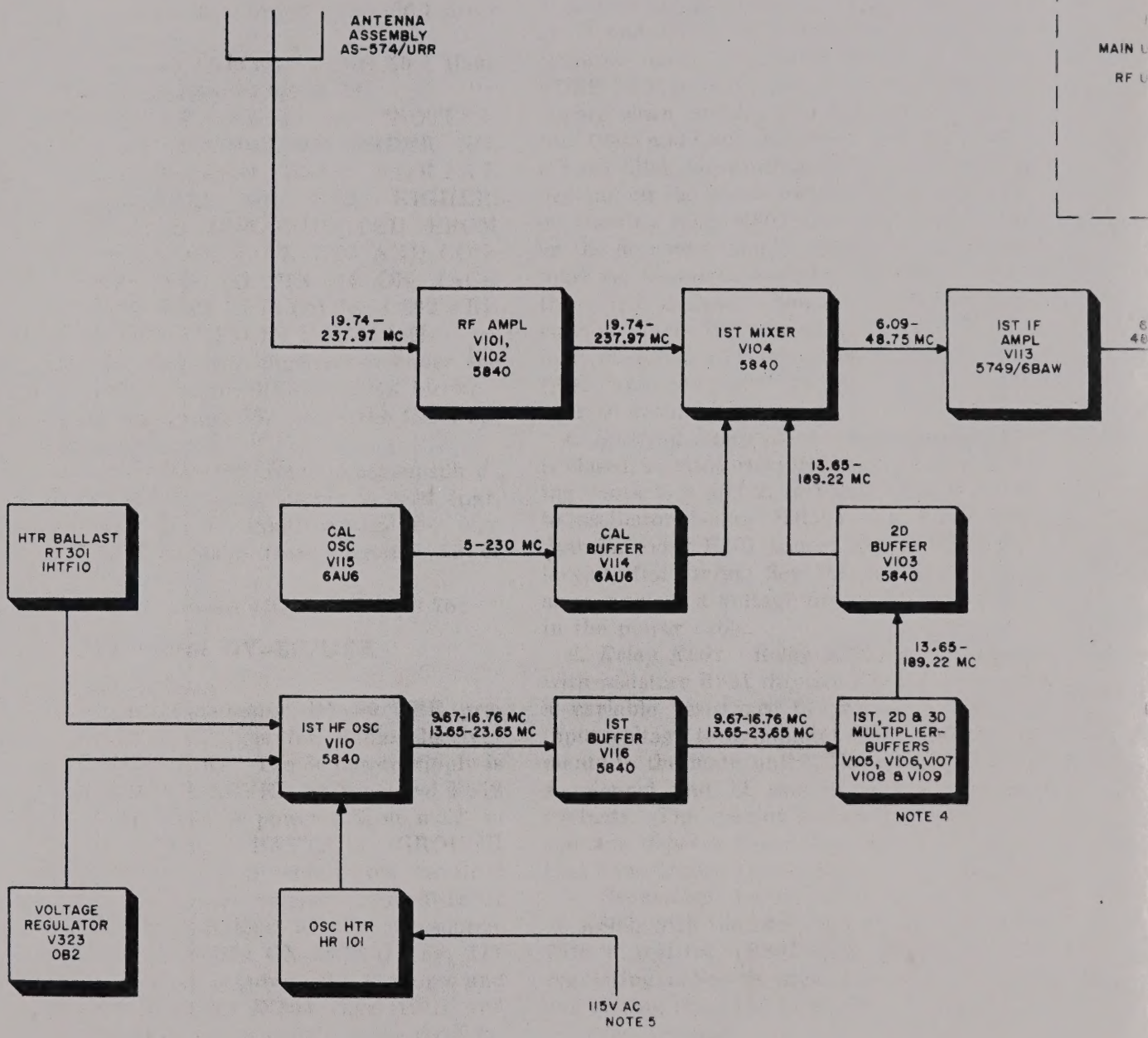
Page 6, paragraph 4. Add the following at the end of paragraph 4:

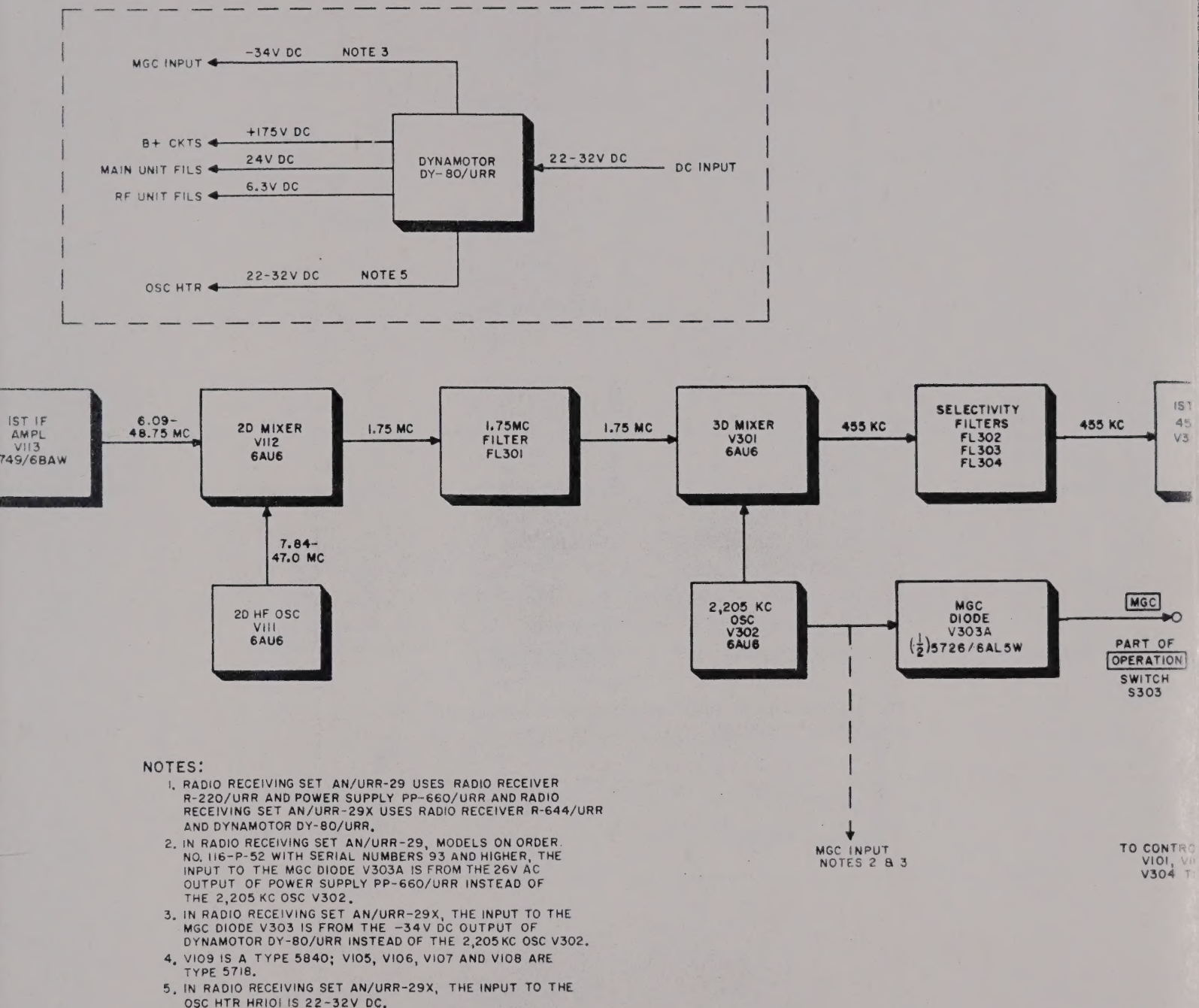
Dynamotor DY–80/URR:

Input at J801 ..... 22 to 32 volts dc at 10 amp.
Output at J802 ..... 175 volts dc at 170 ma.
22 to 32 volts dc at 3.5 amp.
24 volts dc at 2 amp.
6.3 volts dc at 3 amp.
—34 volts dc at .13 ma.
Weight ..... 15 lb.

Page 6, paragraph 5. Make the following changes in subparagraph *b*:

In line 11, add the following after "CG–718/U": For export shipment, Radio Receiving Set AN/URR–29X is identical with Radio Receiving Set AN/URR–29X is identical with Radio Receiving Set AN/URR–29, except that Radio Receiver R–644/URR and Power Cable Assembly CX–3829/U are packed instead of Radio Receiver

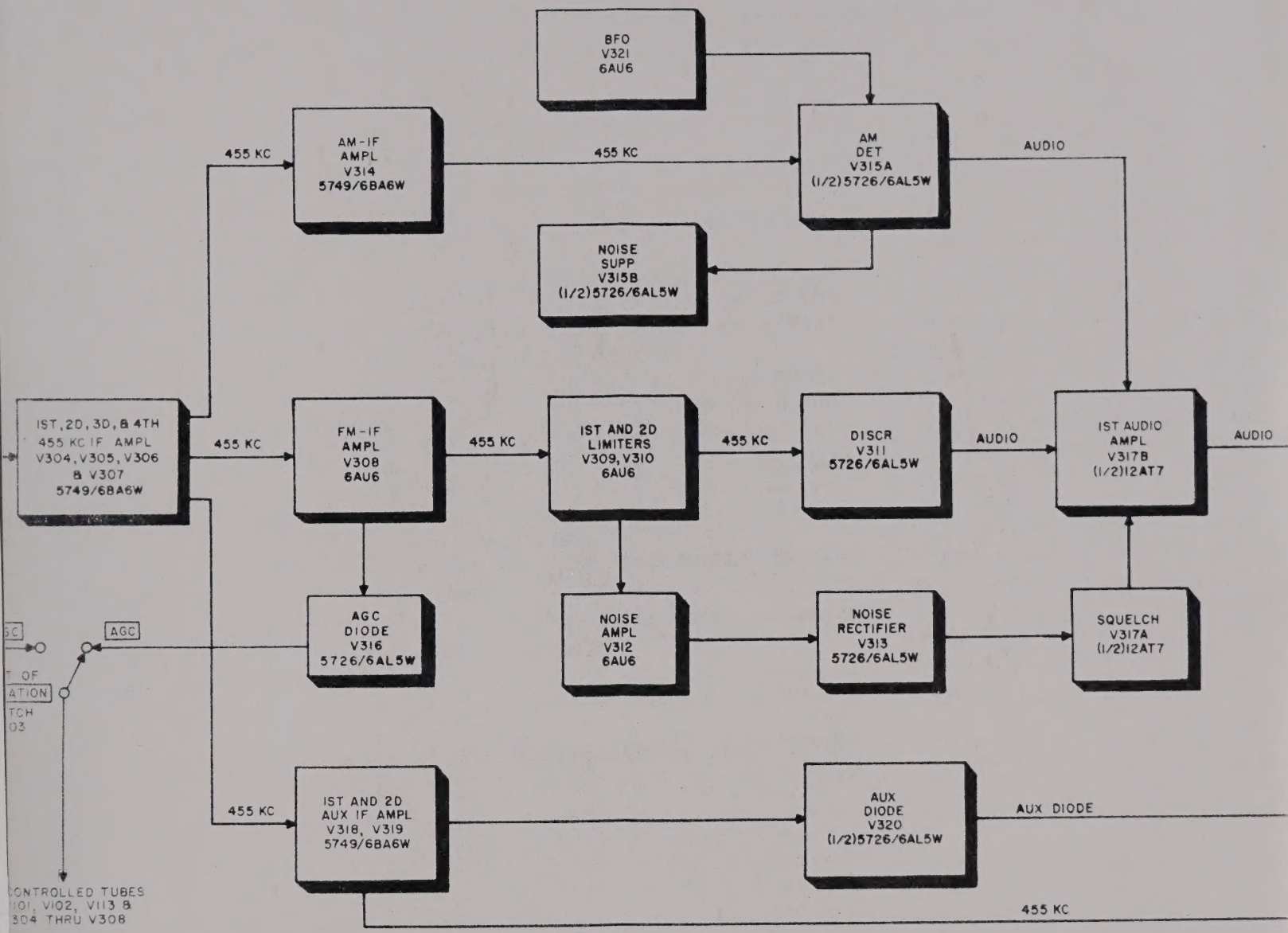

ANTENNA ASSEMBLY AS-574/URR
19.74 – 237.97 MC
RF AMPL V101, V102 5840
19.74 – 237.97 MC
1ST MIXER V104 5840
6.09 – 48.75 MC
1ST IF AMPL V113 5749/6BAW
13.65 – 189.22 MC
HTR BALLAST RT301 IHTF10
CAL OSC V115 6AU6
5-230 MC
CAL BUFFER V114 6AU6
2D BUFFER V103 5840
13.65 – 189.22 MC
1ST HF OSC V110 5840
9.67-16.76 MC 13.65-23.65 MC
1ST BUFFER V116 5840
9.67-16.76 MC 13.65-23.65 MC
1ST, 2D & 3D MULTIPLIER-BUFFERS V105, V106, V107 V108 & V109
NOTE 4
VOLTAGE REGULATOR V323 0B2
OSC HTR HR 101
115V AC NOTE 5



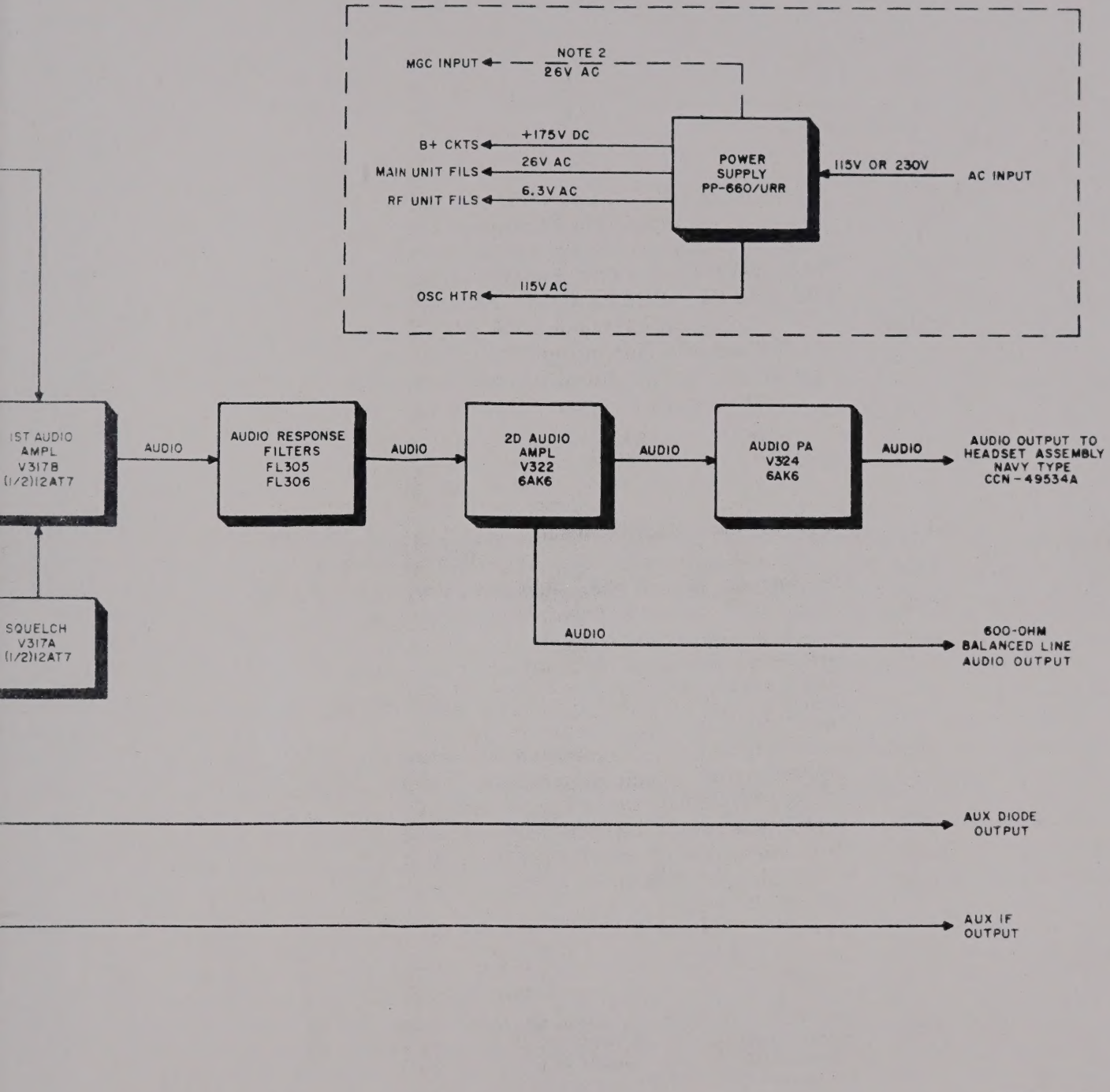
NOTES:

1. RADIO RECEIVING SET AN/URR-29 USES RADIO RECEIVER R-220/URR AND POWER SUPPLY PP-660/URR AND RADIO RECEIVING SET AN/URR-29X USES RADIO RECEIVER R-644/URR AND DYNAMOTOR DY-80/URR.
2. IN RADIO RECEIVING SET AN/URR-29, MODELS ON ORDER NO. 116-P-52 WITH SERIAL NUMBERS 93 AND HIGHER, THE INPUT TO THE MGC DIODE V303A IS FROM THE 26V AC OUTPUT OF POWER SUPPLY PP-660/URR INSTEAD OF THE 2,205 KC OSC V302.
3. IN RADIO RECEIVING SET AN/URR-29X, THE INPUT TO THE MGC DIODE V303 IS FROM THE -34V DC OUTPUT OF DYNAMOTOR DY-80/URR INSTEAD OF THE 2,205 KC OSC V302.
4. V109 IS A TYPE 5840; V105, V106, V107 AND V108 ARE TYPE 5718.
5. IN RADIO RECEIVING SET AN/URR-29X, THE INPUT TO THE OSC HTR HR101 IS 22-32V DC.

Figure 16. Radio Receiving Sets AN/URR



URR-29 and AN/URR-29X, block diagram.


MGC INPUT
NOTE 2
26V AC
B+ CKTS
+175V DC
MAIN UNIT FILS
26V AC
RF UNIT FILS
6.3V AC
POWER SUPPLY PP-660/URR
115V OR 230V
AC INPUT
OSC HTR
115V AC
IST AUDIO AMPL V317B (1/2)12AT7
AUDIO
AUDIO RESPONSE FILTERS FL305 FL306
AUDIO
2D AUDIO AMPL V322 6AK6
AUDIO
AUDIO PA V324 6AK6
AUDIO
AUDIO OUTPUT TO HEADSET ASSEMBLY NAVY TYPE CCN-49534A
SQUELCH V317A (1/2)12AT7
AUDIO
600-OHM BALANCED LINE AUDIO OUTPUT
AUX DIODE OUTPUT
AUX IF OUTPUT

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ducts continuously and a constant negative voltage appears at the plate.

Line 18. Insert the following after "is taken from": the junction of mgc level control R311 and.

Line 20. Insert the following after "This voltage": is set to the desired threshold value by mgc level control R311 (par. 110) and.

Page 84, figure 56. Insert figure 56.1 after figure 56.

Facing page 84 (fold-out), figure 59. Make the following changes to figure 59:

Add the following to the "NOTES": 5. IN MODELS ON ORDER NO. 116-PHILA-52 WITH SERIAL NUMBERS 301 AND HIGHER, S307 IS DISCONNECTED FROM PIN 15 ON JACK J303 AND CONNECTED TO PIN 14 ON JACK J303; R392 IS 75 OHMS; I 302 ARE CONNECTED IN PARALLEL.

Add the following illustration under the Power Supply PP-660/URR block:

Page 85, paragraph 75. Make the following changes:

Add the following after subparagraph *d*:

e. When the dc power supply is used (par. 75.1), —34 volts dc, input voltage for mgc diode V303A is taken from terminal 12 of J802 (fig. 121).

Add the following after paragraph 75:

75.1. Dynamotor DY-80/URR
(fig. 56.1)

a. General. Dynamotor DY-80/URR provides operating voltages for Radio Receiver R-644/URR (fig. 16). The dc power supply is provided with VR LEVEL SET control R812 so that the unit can be powered from a 22- to 32-volt dc source. BATTERY GROUND switch S801 is used to obtain the required polarity output to the receiver, regardless of the polarity connections of the dc source. Power Cable Assembly CX-3829/U (fig. 11) connects the power supply to the dc source and power cable assembly W304 (figs. 101.1 and 121) connects the power supply to the receiver. The power supply cannot be turned on by itself. OPERATION switch S301 on the receiver must be turned on to act as the starting switch in conjunction with starting relay K801 in the dc power supply is provided with two protective circuit elements; one is 20-ampere FUSE F801, to prevent current overloads, and the other is self-regulating relay K802, to prevent excessive voltages to dynamotor D801, which in turn prevents excessive output voltages.

b. Input Circuit. The input voltage, 22 to 32 volts dc, is applied to POWER receptacle J01. Either the plus or minus connection of the dc source can be present at terminals A and B or C and D of J801 because of the circuit changes made by switch S801 (*f* below). FUSE F801 provides protection to the dc power supply when current overloads exist. Capacitors C808 and C807 and choke L802 function as a hash filter, preventing RF signals from appearing on the power cable. Contacts 2 and 3 on starting relay K801 must be closed to turn on the dc power supply; however, switch S301 must be closed to energize the relay. When the switch is closed, the path of the energizing current starts from ground, through the solenoid of K801, through components F801 and L802, and completed through the dc source back to ground.

c. Starting Relay K801. When switch S310 is closed, starting relay K801 is energized, closing contacts 3 and 2, to furnish input voltage to oscillator heater HR101 and relay K802. Starting relay K801 is used also to eliminate a large initial current flow through S310, as well as to prevent a voltage drop that would occur in the power cable.

d. Relay K802. Relay K802, in conjunction with resistors R801 through R812, functions as a variable resistance to provide a regulated input voltage to dynamotor D801 and the filaments in the main unit . The relay consists of a solenoid and 11 sets of parallel-connected contacts. The opening and closing of the relay contacts depends upon the amount of current that flows through the relay solenoid.

e. Regulating Action. Each set of contacts on K802, with the exception of 15, is in series with a resistor (R801 through R810). The regulating action is accomplished by opening and closing the sets of contacts; this inserts or removes resistance in parallel with resistor R811, thereby varying the resistance in series with the input voltage. When the input voltage is 24 volts or less, the current through the solenoid of K802 is of such a value that all of

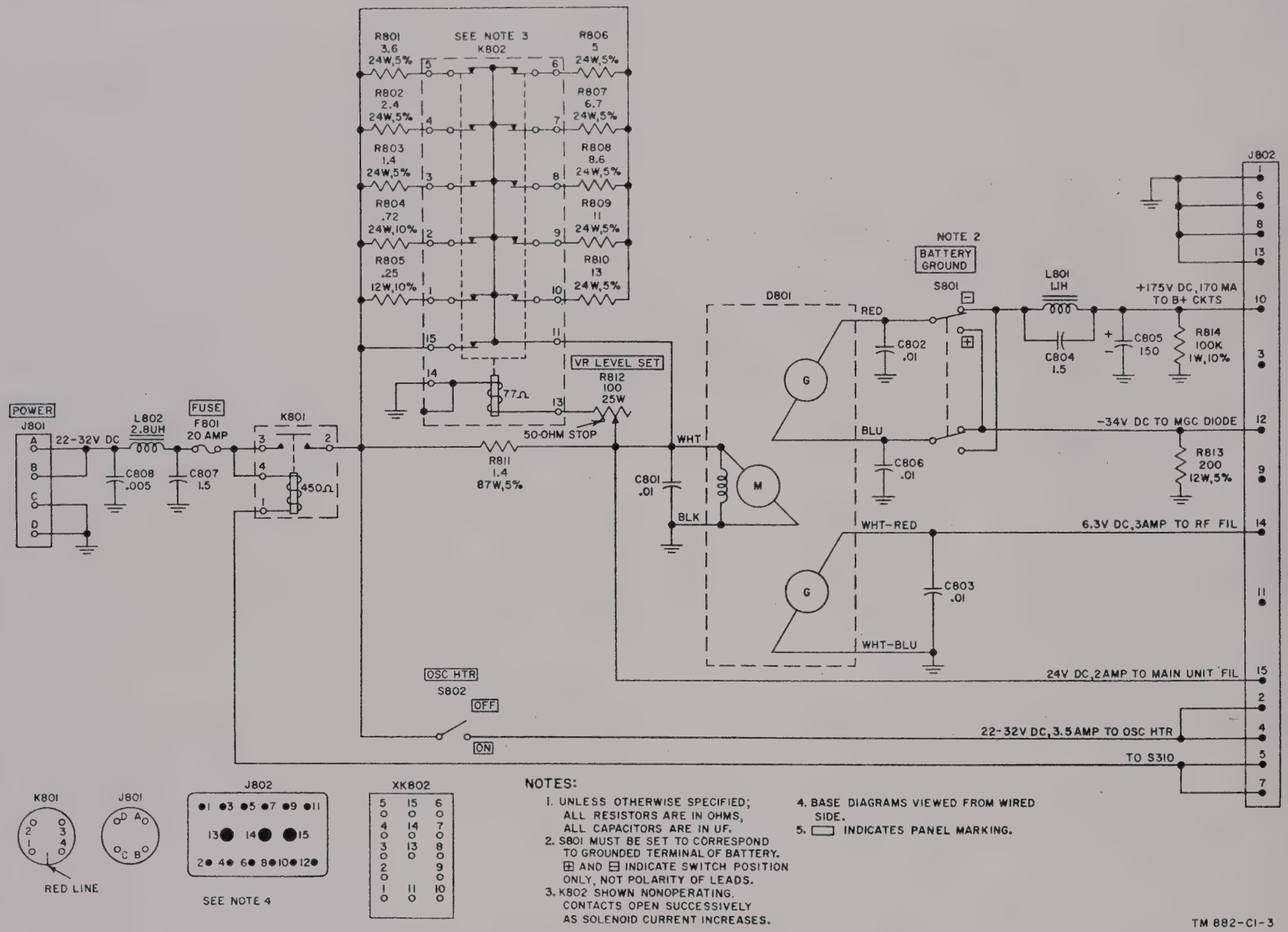
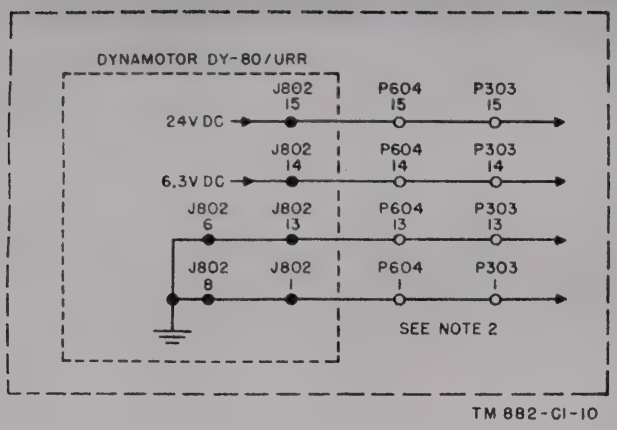


Figure 56.1 Dynamotor DY-80/URR, schematic diagram.



Insert on figure 59.

the relay contacts are closed. As the input voltage and solenoid current increases, contacts 15 and 1 through 10 open successively. At this time, resistors R801 through R811 are shorted by contacts 1 and 15 of K802, and the full input voltage is applied to the dynamotor and the filaments in the main unit. If the input voltage is slightly greater than 24 volts, the current through the solenoid of K802 increases and contact 15 opens. This places parallel-connected resistors R801 through R811 in series with the input voltage. The excess voltage is dropped across the resistors and the voltage applied to the dynamotor and the main unit filaments is maintained close to 24 volts. If the input voltage is higher, the current through the solenoid is greater and additional contacts are opened. This decreases the number of resistors in parallel with R811, and increases the series resistance thereby maintaining the input voltage to the dynamotor and the filaments in the main unit close to 24 volts. VR LEVEL SET control R812 is preset (par. 22.1*b*) so that regulations begin when the input voltage exceeds 24 volts dc.

f. Dynamotor and Output Circuit. Dynamotor D801 consists of an armature winding and two generator windings and changes the 4-volt dc input into three dc outputs. Bypass capacitors C801, C802, C806, and C803 ground any rf voltages present at the dynamotor. Capacitor C805 is an output filter capacitor for the 175-volt dc line. Choke L801 and capacitor C804 form a parallel-resonant circuit at approximately 130 cycles, filtering out an interfering frequency caused by the contacts of relay K802 opening and closing. Resistors R814 acts as a bleeder for capacitor C805. A negative voltage is obtained from dynamotor D801 by connecting the low side of the dynamotor through resistor R813 to ground. The correct setting of BATTERY GROUND switch S801 is important to prevent damage to C805 as well as to the filter capacitors in the receiver. Switch S801 changes the polarity output from D801 so that *plus* 175 volts is always applied to C805 and to output terminal 10 on J802. OSC HTR switch S802 is used to disconnect the voltage to the receiver oscillator heater element HR11, after 1 hour of operation, where it is necessary to prolong battery life.

g. Interchangeability. The dc and ac power supplies are mechanically interchangeable with no changes. They are electrically interchangeable, if the correct power source (par. 4) and power cable assembly W304 (fig. 121), on Order No. 116–Phila–52 with serial numbers 10 and higher, are used.

Page 85, paragraph 76*a*(3). Add the following at the end of subparagraph (3): In models on Order No. 16–Phila–52 with serial numbers 301 and higher, dial lamps I 301 and I 302 are connected in parallel. Switch S307 is connected to 6.3 volts ac at pin 14 of jack J303.

Page 86, paragraph 77*c*. Make the following changes:

Change the second sentence to read: **In Radio Receiver R–220/URR, switch S601 on the ac power supply is set to either the 115 or the 230 position, depending on the power source used.**

Add the following after the second sentence: In Radio Receiver R–644/URR, BATTERY GROUND switch S801 on the dc power supply is set to either the — or the + position, depending on which terminal of the dc source is grounded.

Facing page 86, figure 60. Add the following after the end of "NOTE 6": IN RADIO RECEIVING SET AN/URR–29X, —34V DS IS CONNECTED TO PIN 1 OF V303A.

Page 89, paragraph 79b. Add the following at the end of subparagraph *b*: In Radio Receiver R–644/URR, a locking mechanism is added to the TUNING control to prevent accidental rotation.

Page 91, paragraph 82*b*. Make the following changes:

Symptom	Probable trouble	Correction
Excessive noise in audio output.	Worn brushes; shorted C804 or L801; open C804 or C805; defective K802.	Replace brushes; make voltage and resistance measurements (fig. 66.1); replace if necessary. Replace K802.
Receiver inoperative; main unit filaments light; no B+.	Open armature winding on D81; open L801.	Make resistance measurements (fig. 66.1); replace D801 or L801 if necessary.

Page 94, figure 64. Make the following changes:

Add the following note to figure 64:

NOTE:
FOR ALL MODELS ON ORDER NO. 116–PHILA–52, HEX WRENCH H339 IS MOUNTED ON A BRACKET LOCATED ON THE POWER SUPPLY.

Insert figure 64.1 after figure 64.

Page 94, figure 65. Insert figure 65.1 after figure 65.

Page 95, figure 66. Insert figure 66.1 after figure 66.

Page 97, paragraph 87*c*. In the "Correction" column, change line 7 from bottom to read: **Replace V601 in ac power supply or check continuity of dynamotor D801 in dc power supply and replace if defective. Make resistance measurements (figs. 66 and 66.1).**

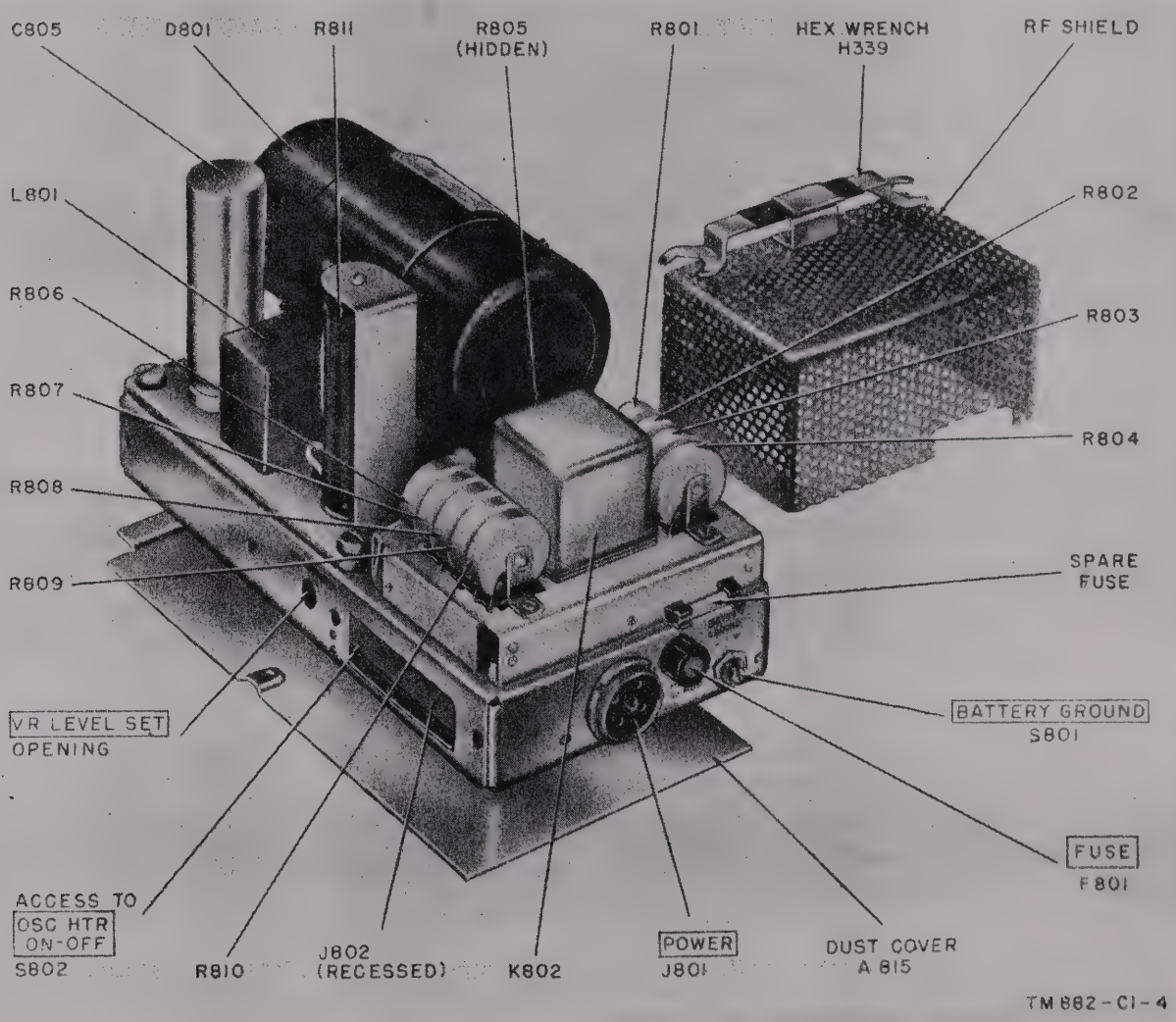


Figure 64.1. Dynamotor DY–80/URR, top view.

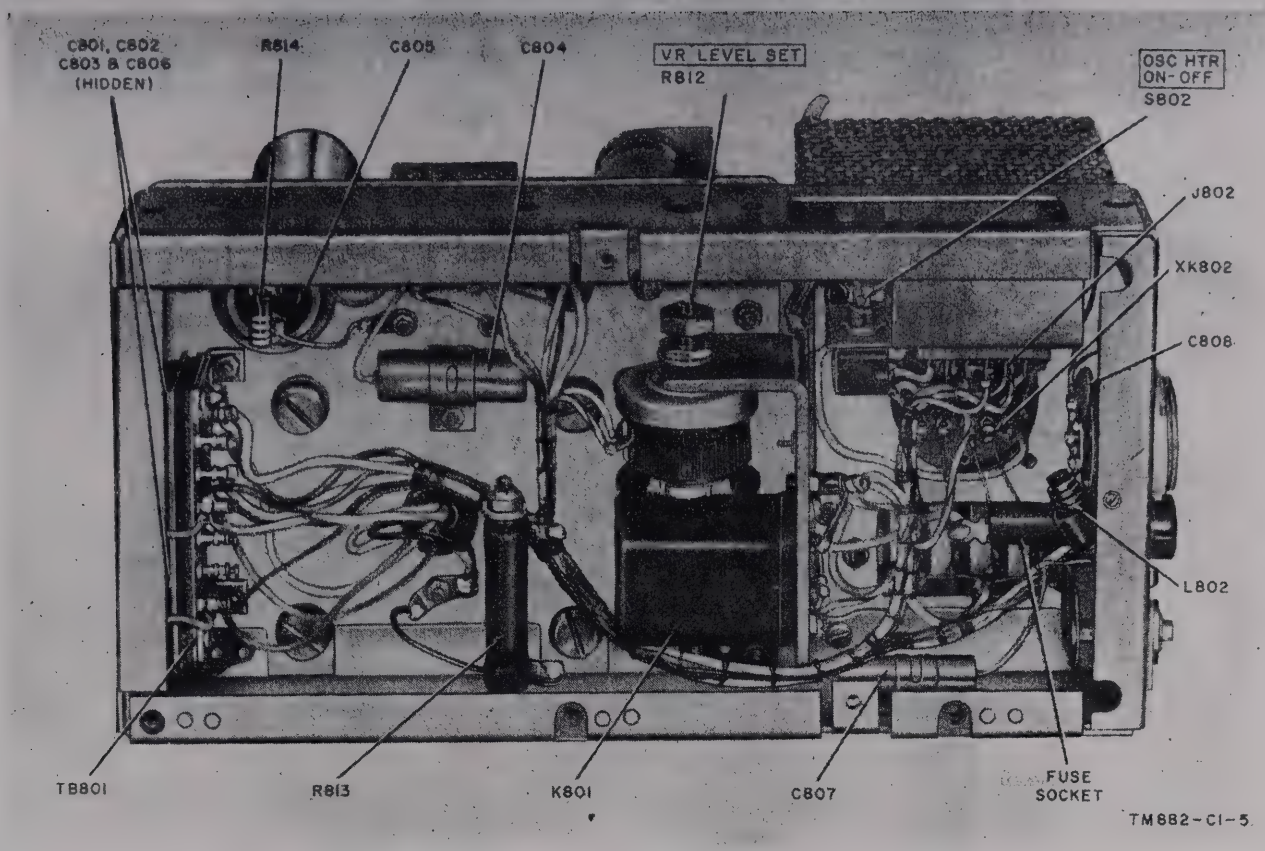


Figure 65.1. Dynamotor DY–80/URR, bottom view.

Page 105, figure 73. Make the following changes to figure 73:

Caption. Change "receiver" to read: **Receiver.**

Add the following note to the figure:

NOTE:

ON RADIO RECEIVER R–644/URR, TWO TUBE PULLERS AND TWO TUBE PIN STRAIGHTENERS ARE MOUNTED TO THE RIGHT OF THE TERMINAL BOARD ON THE REAR OF THE CHASSIS.

Pages 109–112, figures 77 through 80. Delete figures 77 through 80 and substitute:

Page 129, paragraph 92*b*. Make the following changes in subparagraph *b*:

Change the first sentence to read: **The receiver is made up of three major components (figs. 101 and 101.1): the RF unit, the main (base) unit, and the power supply unit.**

Line 6. In two places, add the following after "coaxial": (IF).

Line 12. Add the following after "receiver": (fig. 97).

Line 14. Insert the following before "coaxial": IF.

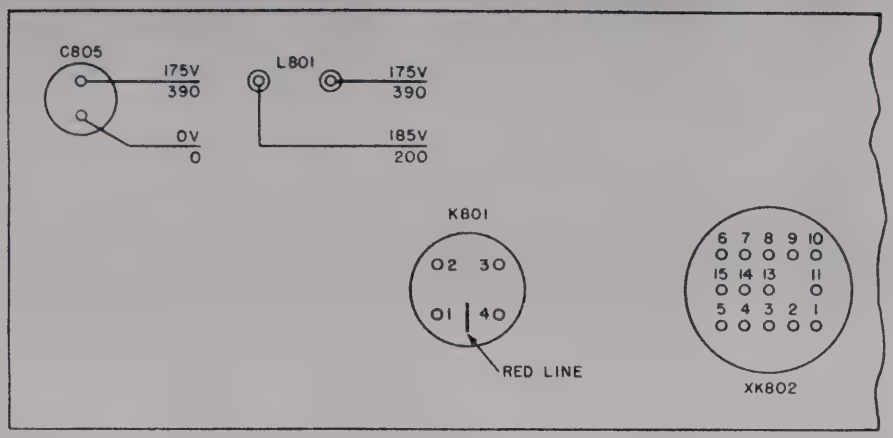
In the "Note," change the first sentence to read: **A spanner wrench is fastened to the main unit at the right side of the receiver; a hexagonal wrench is mounted on a bracket on the power supply.**

Page 130, figure 94. Add the following note to figure 94:

5. WHEN DYNAMOTOR DY–80/URR IS USED, ALL FILAMENT VOLTAGES ARE DC.

Page 131, figure 95. Add the following note to figure 95:

4. WHEN DYNAMOTOR DY–80/URR IS USED, ALL FILAMENT VOLTAGES ARE DC.



K801

TERMINAL	VOLTAGE	RESISTANCE
1	0	∞
2	26	2
3	26	∞
4	26	∞

J801

TERMINAL	VOLTAGE	RESISTANCE
A TO D	26	∞

XK802

TERMINAL	RESISTANCE
1 TO 15	.25
2 TO 15	.72
3 TO 15	1.4
4 TO 15	2.4
5 TO 15	3.6
6 TO 15	5
7 TO 15	6.7
8 TO 15	8.6
9 TO 15	11
10 TO 15	13
11 TO 15	1.4

NOTES:

1. ALL VOLTAGE MEASUREMENTS ARE DC POSITIVE, UNLESS OTHERWISE SPECIFIED, MADE WITH A 20,000 OHMS PER VOLT METER.
2. RESISTANCE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT AND MAIN UNIT DISCONNECTED AND WITH RELAY K802 REMOVED. VOLTAGE MEASUREMENTS ARE MADE TO GROUND WITH [OPERATION] SWITCH IN THE [MGC] POSITION, THE POWER SUPPLY CONNECTED TO A 26VDC SOURCE, AND [BATTERY GROUND] SWITCH IN THE [−] POSITION.
3. ALL VOLTAGE AND RESISTANCE MEASUREMENTS ARE TAKEN WITH [OSC HTR] SWITCH S802 IN THE [ON] POSITION.
4. BASE DIAGRAMS VIEWED FROM WIRED SIDE.

J802

TERMINAL	VOLTAGE	RESISTANCE
2 TO 1	26	5
5 TO 1	0	∞
10 TO 1	175	390
12 TO 1	−34	200
14 TO 1	6.3	2
15 TO 1	26	3

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Figure 66.1. Dynamotor DY–80/URR, voltage and resistance measurements.

Page 131, figure 96. Add the following note to figure 96:

NOTE:

FOR ALL MODELS OF RADIO RECEIVER R–220/URR ON ORDER NO. 116–PHILA–52 AND ALL MODELS OF RADIO RECEIVEVR R–644/URR, HEX WRENCH H339 IS MOUNTED ON A BRACKET ON THE POWER SUPPLY.

Page 132, figure 97. Add the following note on figure 97:

NOTE:

ON RADIO RECEIVER R–644/URR, TWO TUBE PULLERS AND TWO PIN STRAIGHTENERS ARE MOUNTED TO THE RIGHT OF THE TERMINAL BOARD ON THE REAR OF THE CHASSIS.

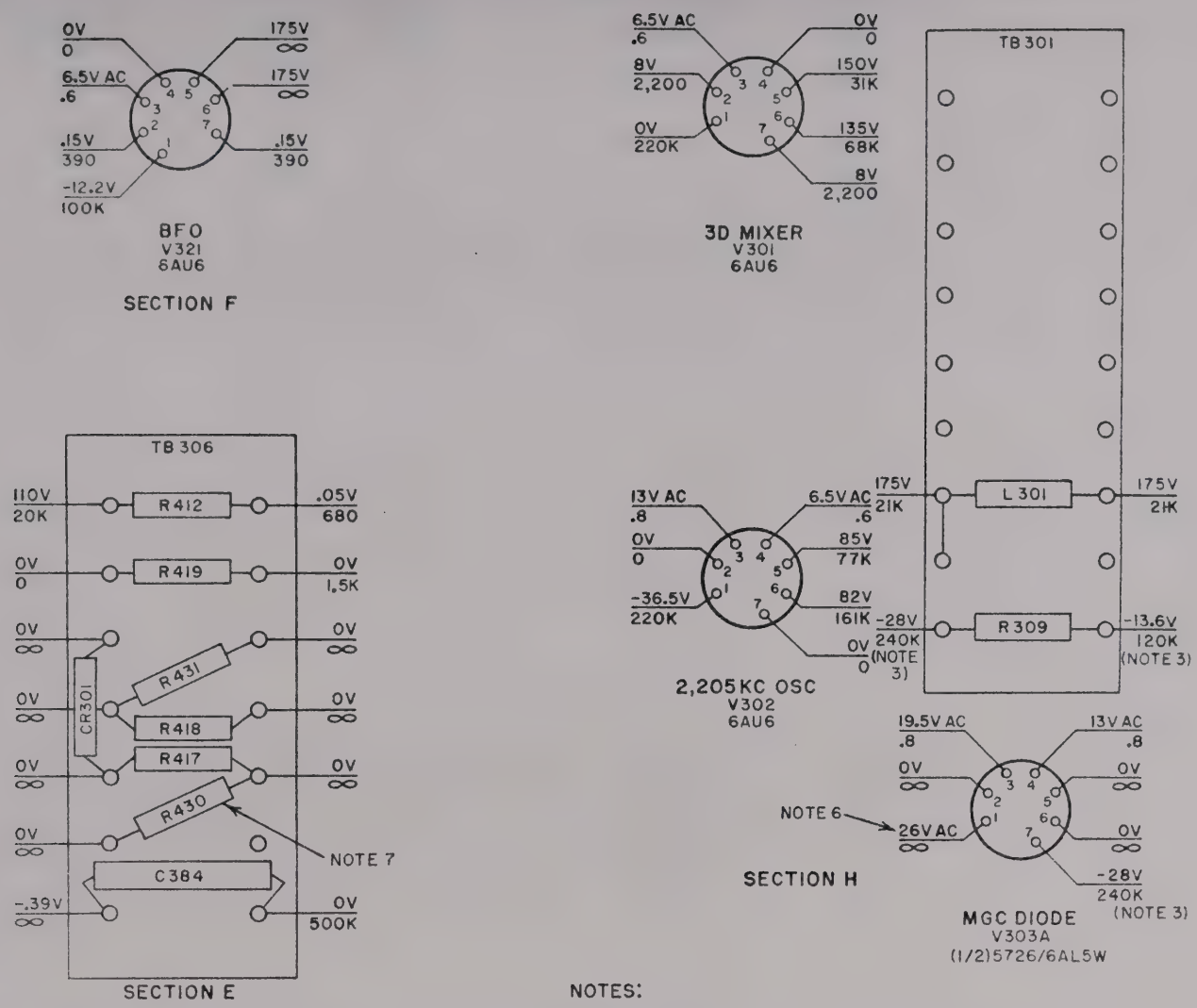
Page 132, paragraph 92*e*(1). Make the following changes to subparagraph (1):

Line 2. Change "controls" to read: **Control knobs.**

Line 4. Change "control" to read: **control knob.**

Line 5. Add the following at the end of the subparagraph: In Radio Receiver R–644/URR, the locking mechanism on the TUNING knob must be removed.

Page 134, paragraph 93*e*(6). Add the following after subparagraph (6):



NOTES:

1. ALL VOLTAGE MEASUREMENTS ARE DC POSITIVE, MADE WITH A 20,000 OHMS PER VOLT METER.
2. RESISTANCE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT AND POWER SUPPLY DISCONNECTED. VOLTAGE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT CONNECTED.
3. DEPENDS ON SETTING OF R311.
4. ALL MEASUREMENTS MADE WITH THE FOLLOWING CONTROL SETTINGS:

CONTROL	SETTING
OPERATION	MGC
SELECTIVITY	50 K.C.
R.F. GAIN SQUELCH	MIDPOSITION
B.F. OSCILLATOR	MIDPOSITION

5. WHEN DYNAMOTOR DY-80/URR IS USED, ALL FILAMENT VOLTAGES ARE DC.
6. WHEN DYNAMOTOR DY-80/URR IS USED, VOLTAGE AT PIN 1 OF V303A IS -34V DC.
7. R430 IS DELETED IN RADIO RECEIVER R-220/URR WITH SERIAL NUMBERS 201 AND HIGHER.

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Figure 77. Sections E, F, and H, voltage and resistance measurements.

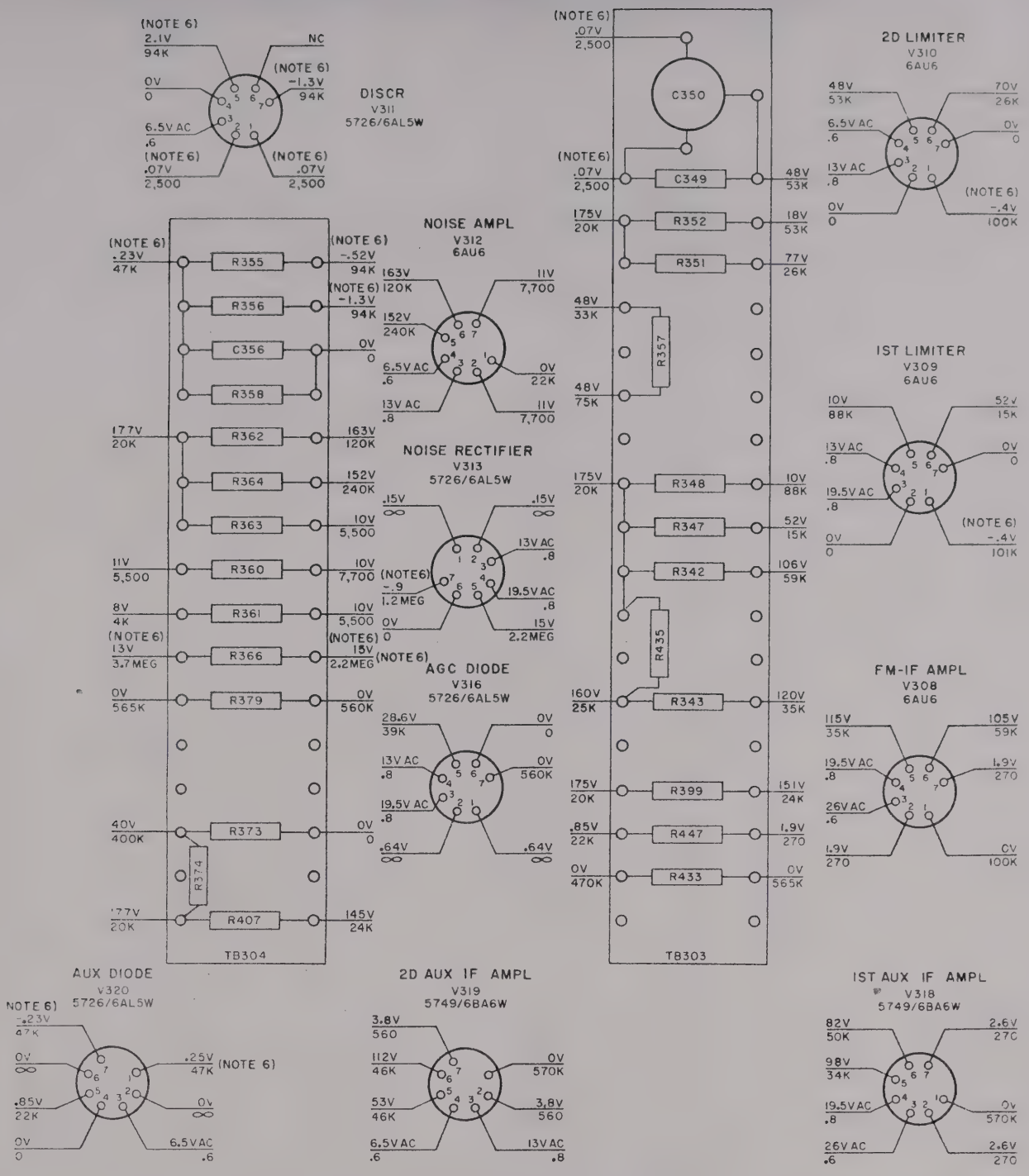
Caution: On Radio Receivers AN/URR–29, with serial numbers 889 and above, wedge a screwdriver between the hub of the flexible coupler and the front side of the rear control head plate, to prevent excessive coupler flexing as the mixer section is removed.

Page 134, paragraph 94. Make the following changes in paragraph 94:

Under paragraph heading, change "figs. 104, 105, 106, 122, and 123)" to read: **(figs. 104–106.3 and 122–123.3).**

Subparagraph *a*. Delete subparagraph *a* and substitute the following:

a. General. The control head of Radio Receiver R–220/URR consists of gear-assemblies that are used to tune the receiver to any fre-



NOTES:

1. ALL VOLTAGE MEASUREMENTS ARE DC POSITIVE MADE WITH A 20,000 OHMS PER VOLT METER, UNLESS OTHERWISE SPECIFIED.
2. RESISTANCE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT AND POWER SUPPLY DISCONNECTED. VOLTAGE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT CONNECTED.
3. NC INDICATES NO CONNECTION.
4. ALL MEASUREMENTS MADE WITH THE FOLLOWING CONTROL SETTINGS:

CONTROL	SETTING
OPERATION	MGC
SELECTIVITY	200 K.C.
R.F. GAIN SQUELCH	MIDPOSITION
METER	OUTPUT LOW
DISCR METER CENTER CONTROL	MIDPOSITION

5. WHEN DYNAMOTOR DY-80/URR IS USED ALL FILAMENT VOLTAGES ARE DC.
6. MEASUREMENTS MADE WITH A VTVM

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Figure 78. Section G, voltage and resistance measurements.

NOTES:

1. ALL VOLTAGE MEASUREMENTS ARE DC POSITIVE, MADE WITH A 20,000 OHMS PER VOLT METER.
2. RESISTANCE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT AND POWER SUPPLY DISCONNECTED. VOLTAGE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT CONNECTED.
3. ALL MEASUREMENTS MADE WITH THE FOLLOWING CONTROL SETTINGS:

CONTROL	SETTING
OPERATION	AM SQUELCH
SELECTIVITY	50 K.C.
R.F. GAIN SQUELCH	MIDPOSITION (SEE NOTE 4)

4. READINGS IN PARENTHESES TAKEN WITH THE R.F. GAIN-SQUELCH CONTROL FULLY COUNTERCLOCKWISE.
5. NC INDICATES NO CONNECTION.
6. WHEN DYNAMOTOR DY-80/URR IS USED, ALL FILAMENT VOLTAGES ARE DC.

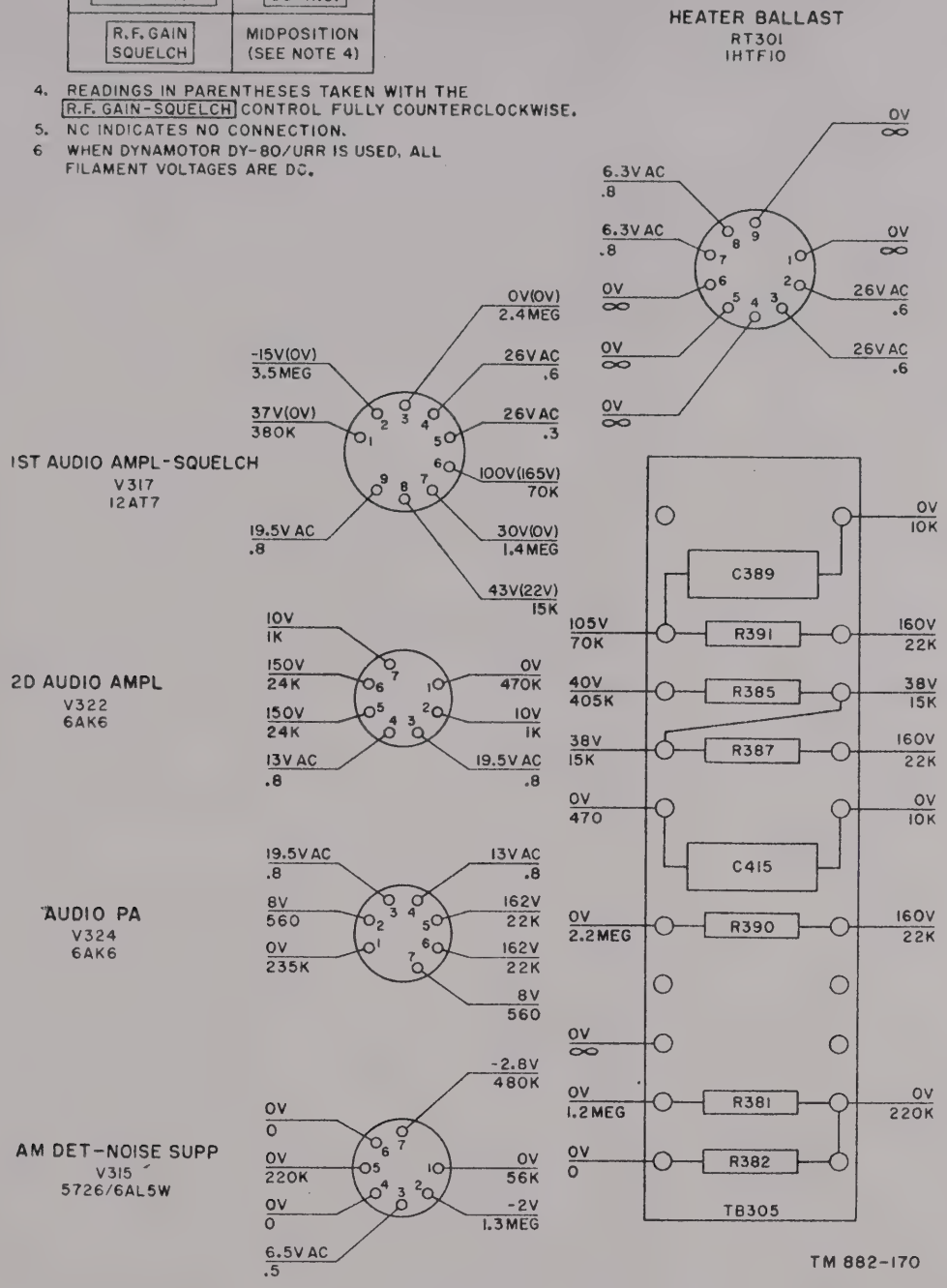


Figure 79. Section J, voltage and resistance measurements.

NOTES:

1. ALL VOLTAGE MEASUREMENTS ARE DC POSITIVE, MADE WITH A 20,000 OHMS PER VOLT METER, UNLESS OTHERWISE SPECIFIED.

2. RESISTANCE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT AND POWER SUPPLY DISCONNECTED. VOLTAGE MEASUREMENTS ARE MADE TO GROUND WITH THE RF UNIT CONNECTED.

3. ALL MEASUREMENTS MADE WITH THE FOLLOWING CONTROL SETTINGS:

CONTROL	SETTING
OPERATION	MGC
SELECTIVITY	200 K.C.
R.F. GAIN SQUELCH	MIDPOSITION

4. WHEN DYNAMOTOR DY-80/URR IS USED ALL FILAMENT VOLTAGES ARE DC.

5. MEASUREMENTS MADE WITH A VTVM.

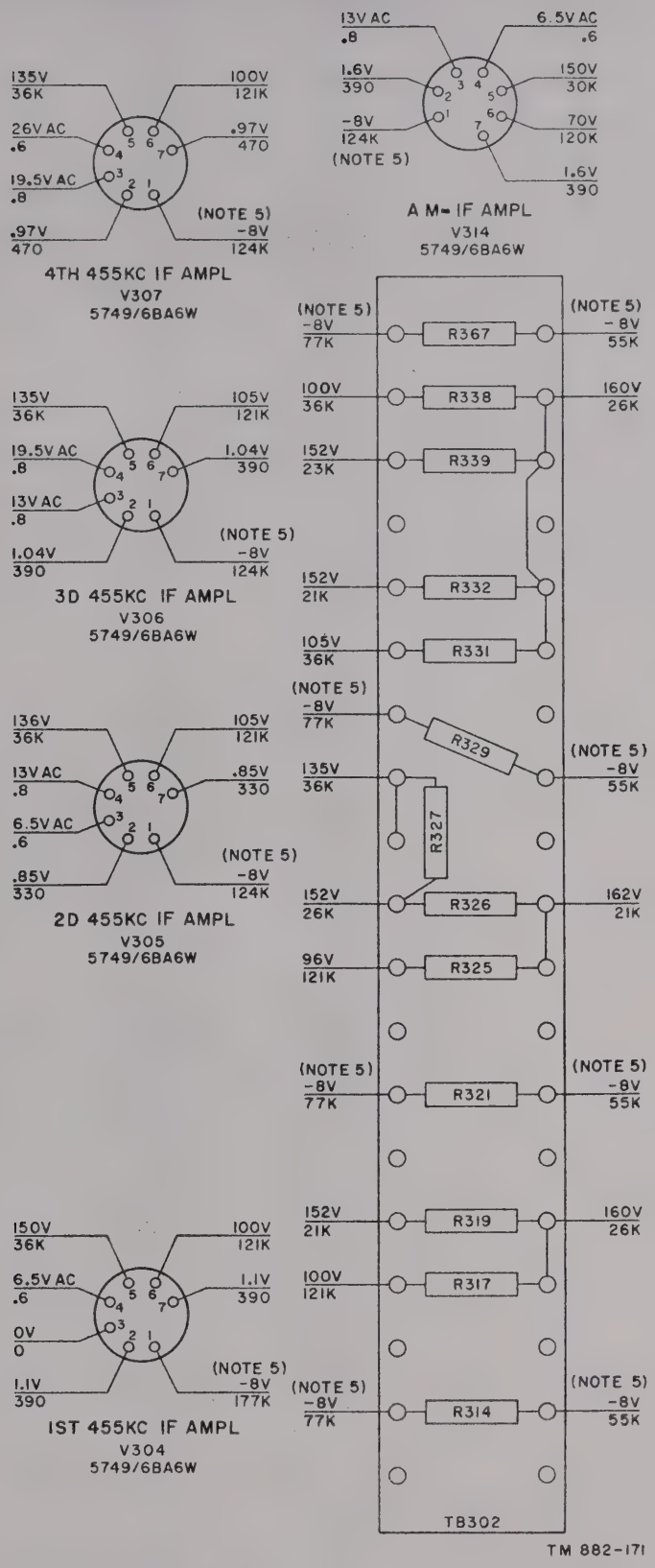


Figure 80. Section K, voltage and resistance measurements.

quency within the range of 20 to 30 mc. An overall view of the control head is shown in figure 104. Three types of control heads are used in Radio Receiver R–220 URR; they will be referred to as type No. 1, type No. 2, and type No. 3. Type No. 1 is used on receivers with serial numbers 1 through 157. Type No. 2 is used on receivers with serial numbers 158 through 512. Type No. 3 is used on receivers with serial numbers 513 and higher. Control head, type No. 3, is used effectively with serial number 1 of Radio Receiver R–644/URR. Each type control head performs the same function. The various parts of the control head are mounted on three plates. Disassembly procedures for each type of control head are separated except in the case of similar assemblies. Disassembly and assembly for control head, type No. 1, is described in paragraph 94*b* through *h*. Disassembly and assembly for control head, type No. 2, is described in paragraph 94*i* through *l*. Disassembly and assembly for control head, type No. 3, is described in paragraph 94*m* through *q*. When starting a disassembly procedure, first note the serial number of the receiver from which the control head is removed, and then refer to the paragraph that applies to the particular receiver serial number. Refer to the proper figure to locate the assembly, then to the proper exploded view to locate the individual parts of the assembly.

Caution: Disassembly of the control head should be limited to those parts that are maintenance items.

Subparagraph *b*. Change the heading to read: **Partial Disassembly of Control Head, Type No. 1.**

Page 135, figure 100. Add the following note on figure 100:

NOTE:

ON RADIO RECEIVER R–644/URR, THE POWER INPUT JACK IS J801. TWO TUBE PULLERS AND TWO PIN STRAIGHTENERS ARE MOUNTED AT THE RIGHT OF THE TERMINAL BOARD ON THE REAR OF THE CHASSIS.

Page 136, figure 101. Insert figure 101.1 after figure 101.

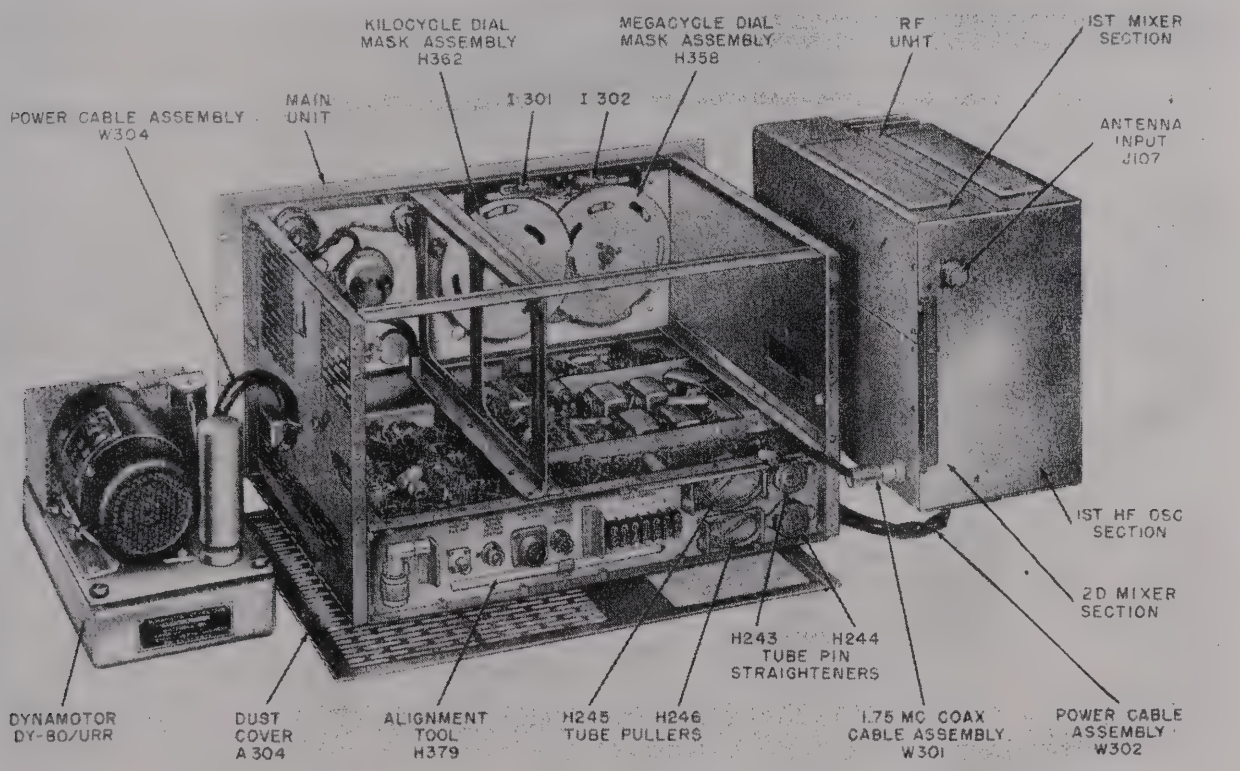


Figure 101.1 Radio Receiver R–644/URR, with RF unit and power supply removed.

Page 138, figure 105. Change the caption to read: **Control head, types No. 1 and No. 2, assemblies A through L (serial numbers 1 through 512 on Radio Receiver R–220/URR).**

Page 139, figure 106. Change the caption to read: **Control head, type No. 1, assemblies M through X (serial numbers 1 through 157 on Radio Receiver R–220/URR).**

Page 140, paragraph 94*f*. Change the heading to read: **Assembly of Control Head, Type No. 1.**

Page 143, paragraph 94*h*. Add subparagraphs *i* through *q* and figures 106.1 through 106.3 after subparagraph *h*:

i. Partial Disassembly of Control Head, Type No. 2 (fig. 104, 105, 106.1, 122, and 123.1). Partial disassembly of control head, type No. 2, is outlined below.

(1) *Assembly CC removal.*

(*a*) Loosen two setscrews M1 so that gear M2 can clear gear T3.

(*b*) Remove four hexagonal nuts DD6 and lockwashers DD5 on rear corners of the control head. Remove bearing plate alinement bars DD1 and spacers DD4.

(*c*) Carefully separate assembly CC from assembly BB.

(2) *Assembly AA removal.*

(*a*) Perform the step in (1) (*b*) above.

(*b*) Remove setscrew T1 and pin T2 from hub of gear T3. This frees assembly AA.

(*c*) Carefully separate assembly AA from assembly BB.

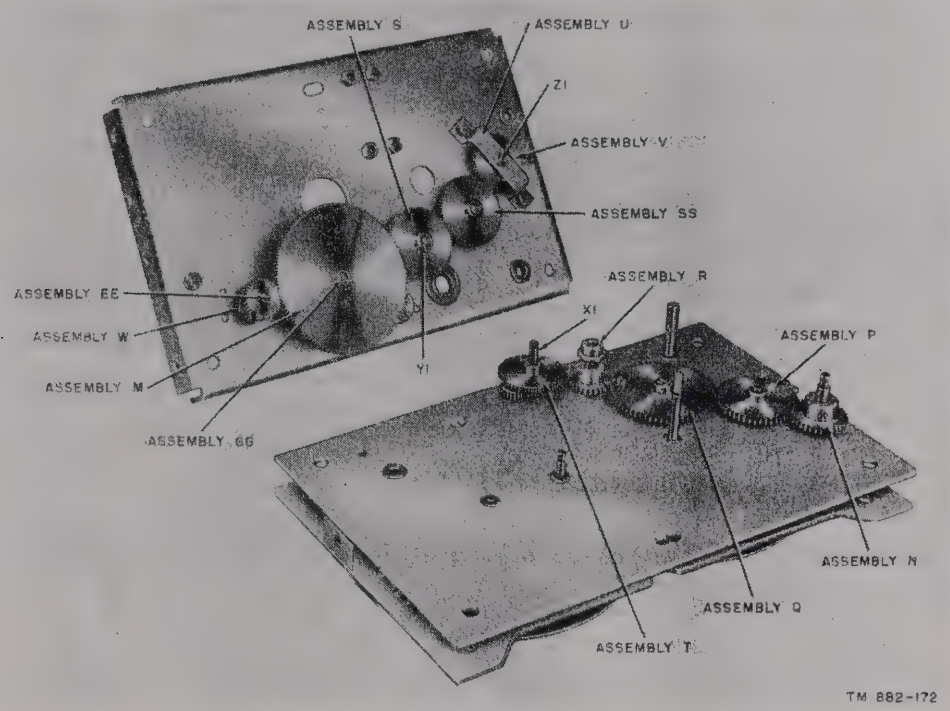


Figure 106.1. Control head, type No. 2, assemblies M through Z (serial numbers 158 through 512 on Radio Receiver R–220/URR).

Note. To prevent stops and parts on shaft X1 from falling off, temporarily insert a paper clip through the pinhole on shaft X1.

j. Disassembly of Parts on Assemblies BB and CC. The assemblies on assemblies BB and CC are removed as described below. The parts mounted on the front two assemblies (AA and BB) are similar to the parts on control head, type No. 1. Refer to paragraph 94*c* and *d* for disassembly of these parts.

(1) *Assembly N.* Remove pin N1. Remove gear N2 from shaft N3.

(2) *Assembly P.* Remove retainer ring P1 and gear P2 from stud BB12.

(3) *Assembly Q.* Remove retainer ring Q1 and gear Q2 from stud BB16.

(4) *Assemblies R and S.* Remove retainer ring S1 and gear S2 from stud Y4. Remove assembly R from bearing BB14. Remove pin R1 and separate gear R2 from shaft R3.

(5) *Assembly SS.* Remove retainer ring SS1 and gear SS2 from stud Y4.

(6) *Assemblies U, V, and Z1.* Unscrew two screws U1 that hold bracket U4. Remove hexagonal nuts U2 and lockwashers U3. Remove gear V2 and shaft Z1.

(7) *Assemblies W and EE.* Loosen two setscrews W1 and remove gears W2 and W3 from shaft EE3. Remove pin EE1 and coupler EE2 from shaft EE3.

(8) *Assembly Y.* Remove two hexagonal nuts Y1, washers Y2 and Y3, and stud Y4.

(9) *Assemblies FF and GG.* Remove pin FF1 and coupler FF2 from shaft FF3. Remove hexagonal nut GG1, washer GG2, and bearing GG3.

k. Assembly of Control Head, Type No. 2. When replacing the various assemblies on the bearing plates, reverse the steps for removal. To reassemble assemblies AA, BB, and CC, proceed as follows:

(1) Place assembly CC on a flat surface, gear side up. The setscrews that hold gear M2 should be loose so the gear may be moved to edge of shaft FF3 to provide clearance for gear T3 and shaft X1.

(2) Join assembly BB to assembly CC; carefully mesh proper gears between plates.

(3) Place spacers DD4 at four corners, between plates.

(4) Before joining assembly AA to assembly BB, be sure the spring-loaded gear assemblies are correctly adjusted to prevent backlash. On these assemblies, the gear nearest bearing plate AA1 or BB1 is fixed; the one flush above is the free gear. Rotate the free gears indicated below counterclockwise from the point at which spring compression starts, to the nearest number of teeth positions specified. Maintain the spring-loading set, by meshing each gear to the connecting gear, which is mounted on the same plate. If the connecting gear is on the opposing assembly plate, use a paper clip or similar device to maintain the proper tension.

(a) Assembly K. Rotate the free gear on the lower section of gear assembly three teeth positions and mesh with gear B1. Rotate free gear on the upper section of gear assembly three teeth positions and mesh with gear J1.

(b) Assembly A. Rotate the free gear three teeth positions and mesh with gear B1.

(c) Assembly H. Rotate the free gear of lower set two teeth positions and mesh with gear of assembly G. Rotate the free gear of upper set two teeth positions; use a paper clip to maintain the proper tension.

(d) Assembly C. Rotate the free gear two teeth positions; use a paper clip to maintain the proper tension.

(5) Join assembly AA to assembly BB; carefully mesh proper gears between plates.

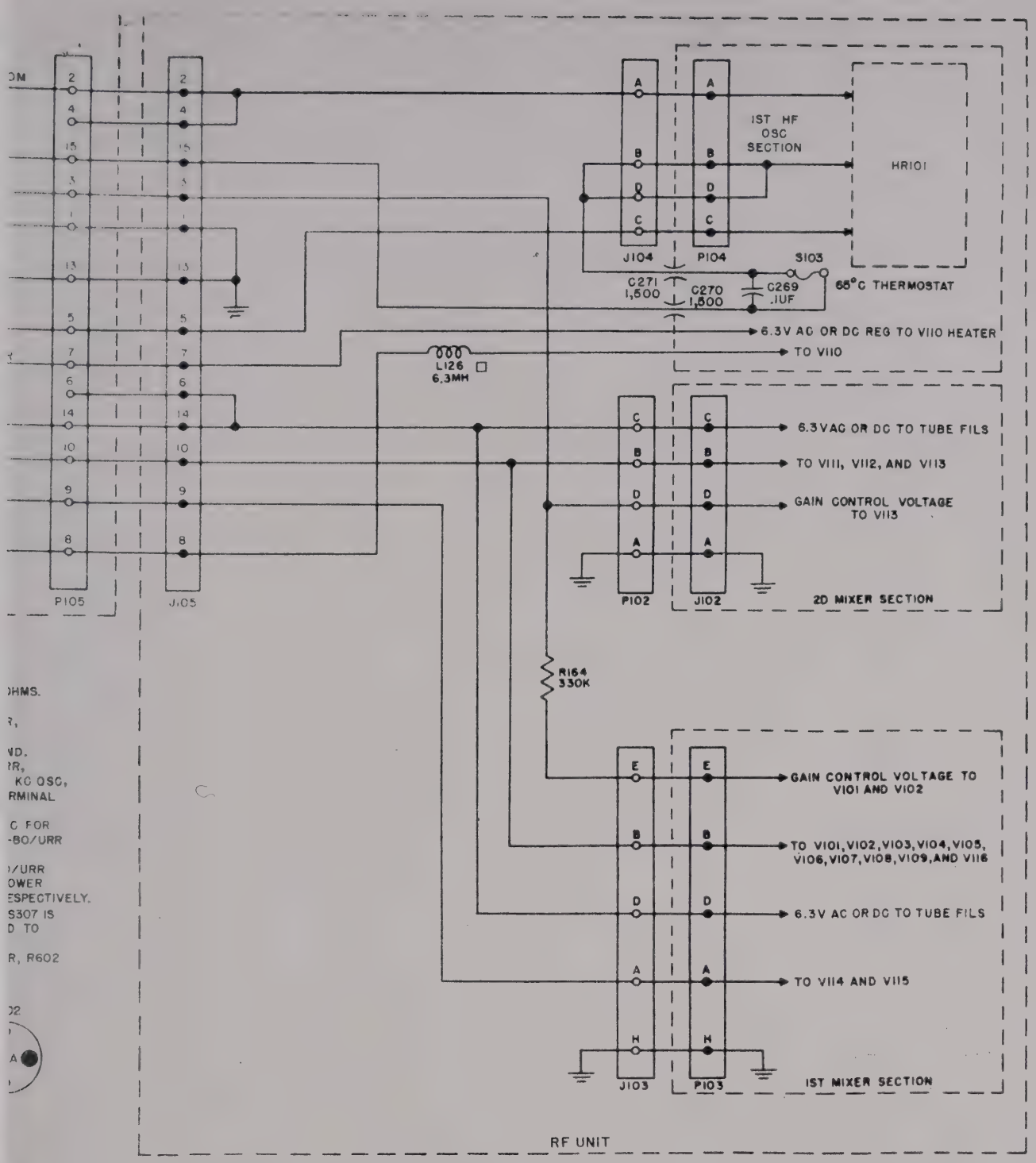
(6) Place spacers DD3 at four corners, between plates. Place spacers DD2 at four corners on assembly AA.

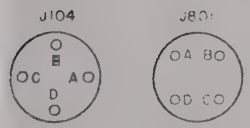
(7) Insert four bearing plate alinement bars DD1 through spacers and plates.

(8) Carefully slide the control head to the edge of the work bench so that two washers DD5 and hexagonal nuts DD6 can be fastened from the underside. Rotate the control head halfway and fasten the remaining two washers and hexagonal nuts. After the gears are meshed properly and the shafts are in bearing holes, tighten the four hexagonal nuts DD6.

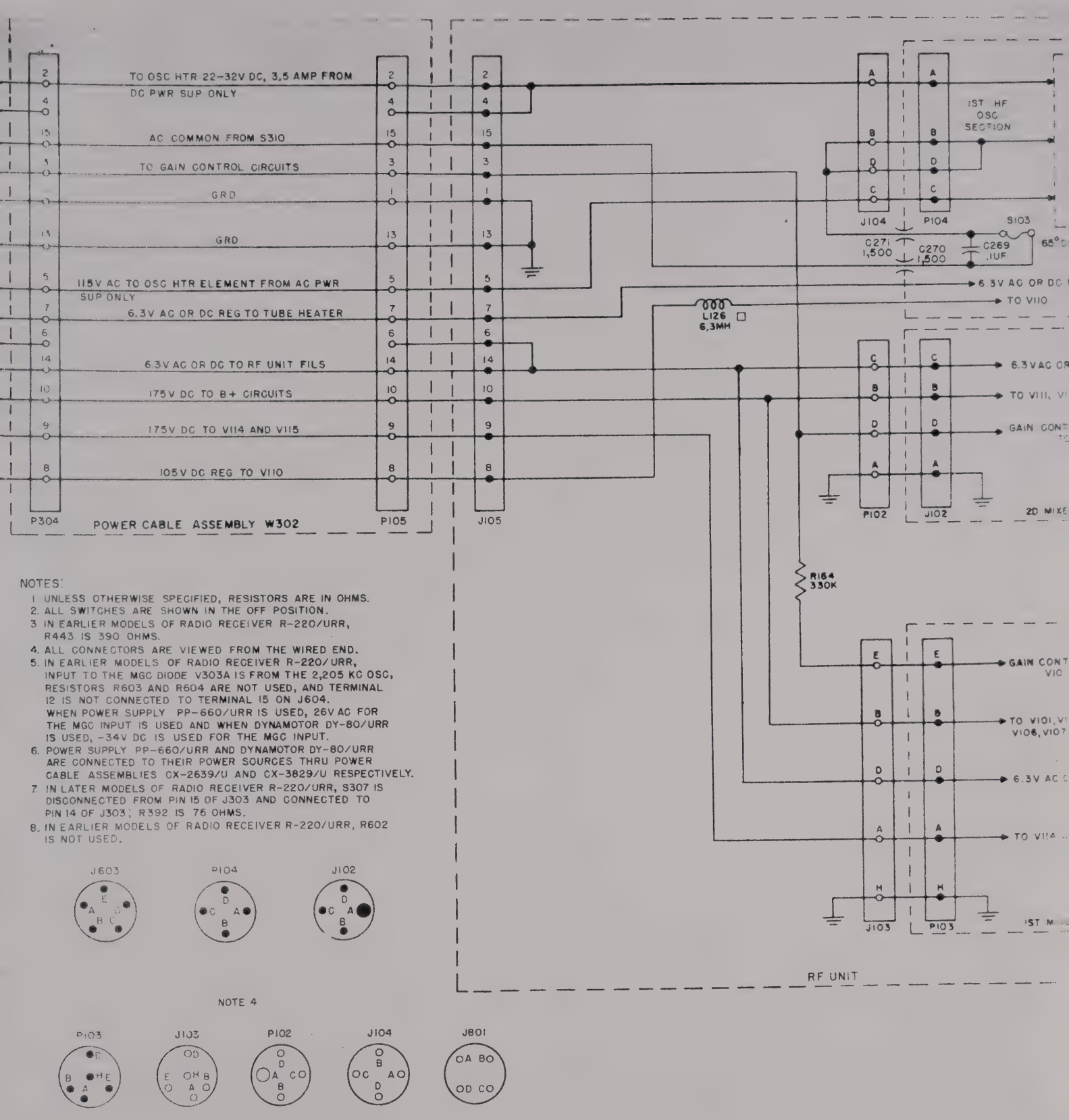
(9) Tighten two setscrews M1 on assembly M.

(10) Assemble dial E2 to shaft B5 and tighten the three setscrews.


P105
J105
J104
P104
1ST HF OSC SECTION
HR101
S103
65°C THERMOSTAT
C271 1,500
C270 1,500
C269 .1UF
6.3V AC OR DC REG TO V110 HEATER
TO V110
L126 6.3MH
P102
J102
2D MIXER SECTION
6.3VAC OR DC TO TUBE FILS
TO V111, V112, AND V113
GAIN CONTROL VOLTAGE TO V113
R164 330K
J103
P103
1ST MIXER SECTION
GAIN CONTROL VOLTAGE TO V101 AND V102
TO V101, V102, V103, V104, V105, V106, V107, V108, V109, AND V116
6.3V AC OR DC TO TUBE FILS
TO V114 AND V115
RF UNIT


J104
J80
OC
AO
OA BO
OD CO

TM 882-C1-11



NOTES:

1. UNLESS OTHERWISE SPECIFIED, RESISTORS ARE IN OHMS.
2. ALL SWITCHES ARE SHOWN IN THE OFF POSITION.
3. IN EARLIER MODELS OF RADIO RECEIVER R-220/URR, R443 IS 390 OHMS.
4. ALL CONNECTORS ARE VIEWED FROM THE WIRED END.
5. IN EARLIER MODELS OF RADIO RECEIVER R-220/URR, INPUT TO THE MGC DIODE V303A IS FROM THE 2,205 KC OSC, RESISTORS R603 AND R604 ARE NOT USED, AND TERMINAL 12 IS NOT CONNECTED TO TERMINAL 15 ON J604. WHEN POWER SUPPLY PP-660/URR IS USED, 26V AC FOR THE MGC INPUT IS USED AND WHEN DYNAMOTOR DY-80/URR IS USED, -34V DC IS USED FOR THE MGC INPUT.
6. POWER SUPPLY PP-660/URR AND DYNAMOTOR DY-80/URR ARE CONNECTED TO THEIR POWER SOURCES THRU POWER CABLE ASSEMBLIES CX-2639/U AND CX-3829/U RESPECTIVELY.
7. IN LATER MODELS OF RADIO RECEIVER R-220/URR, S307 IS DISCONNECTED FROM PIN 15 OF J303 AND CONNECTED TO PIN 14 OF J303; R392 IS 75 OHMS.
8. IN EARLIER MODELS OF RADIO RECEIVER R-220/URR, R602 IS NOT USED.

NOTE 4

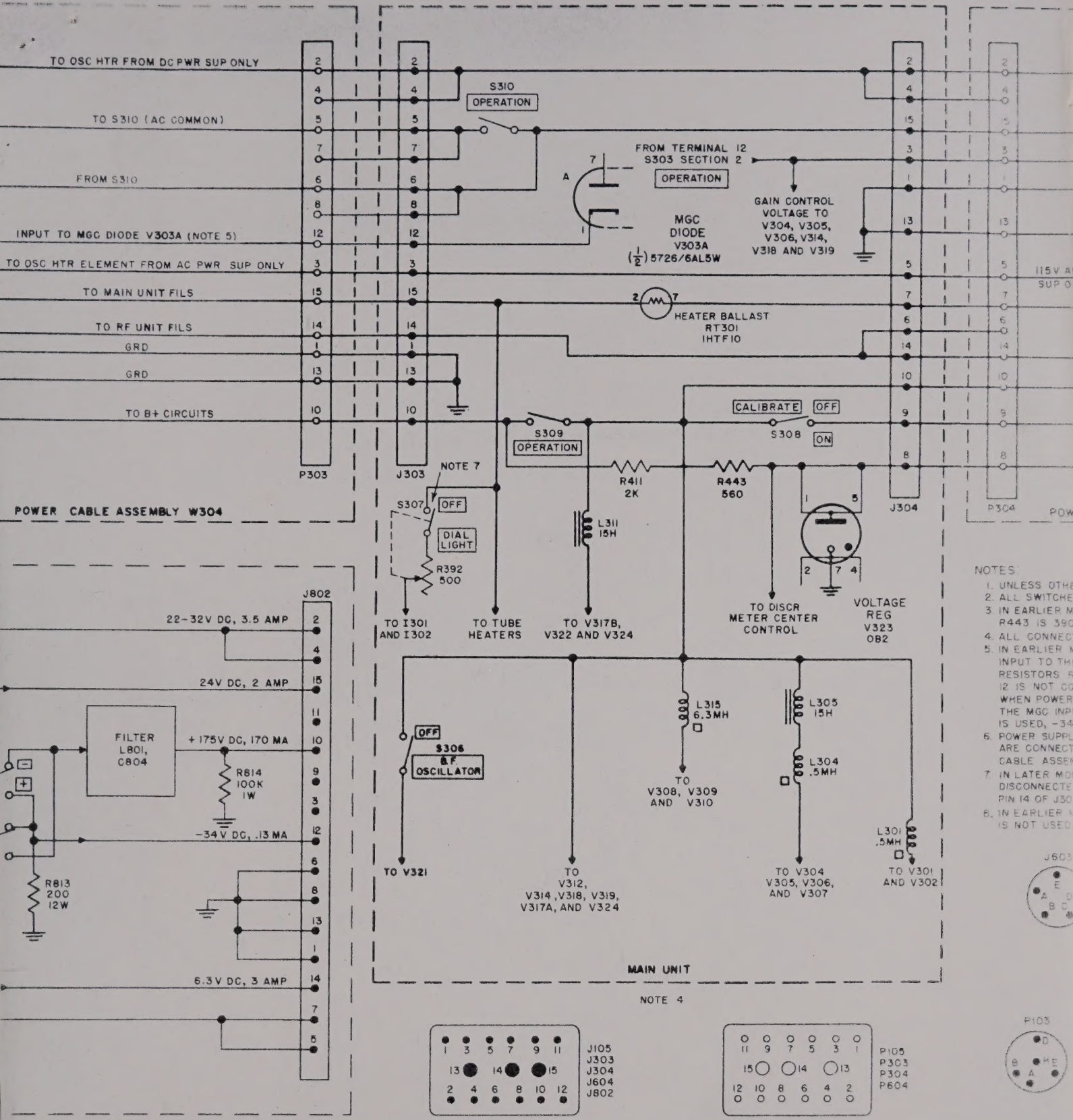
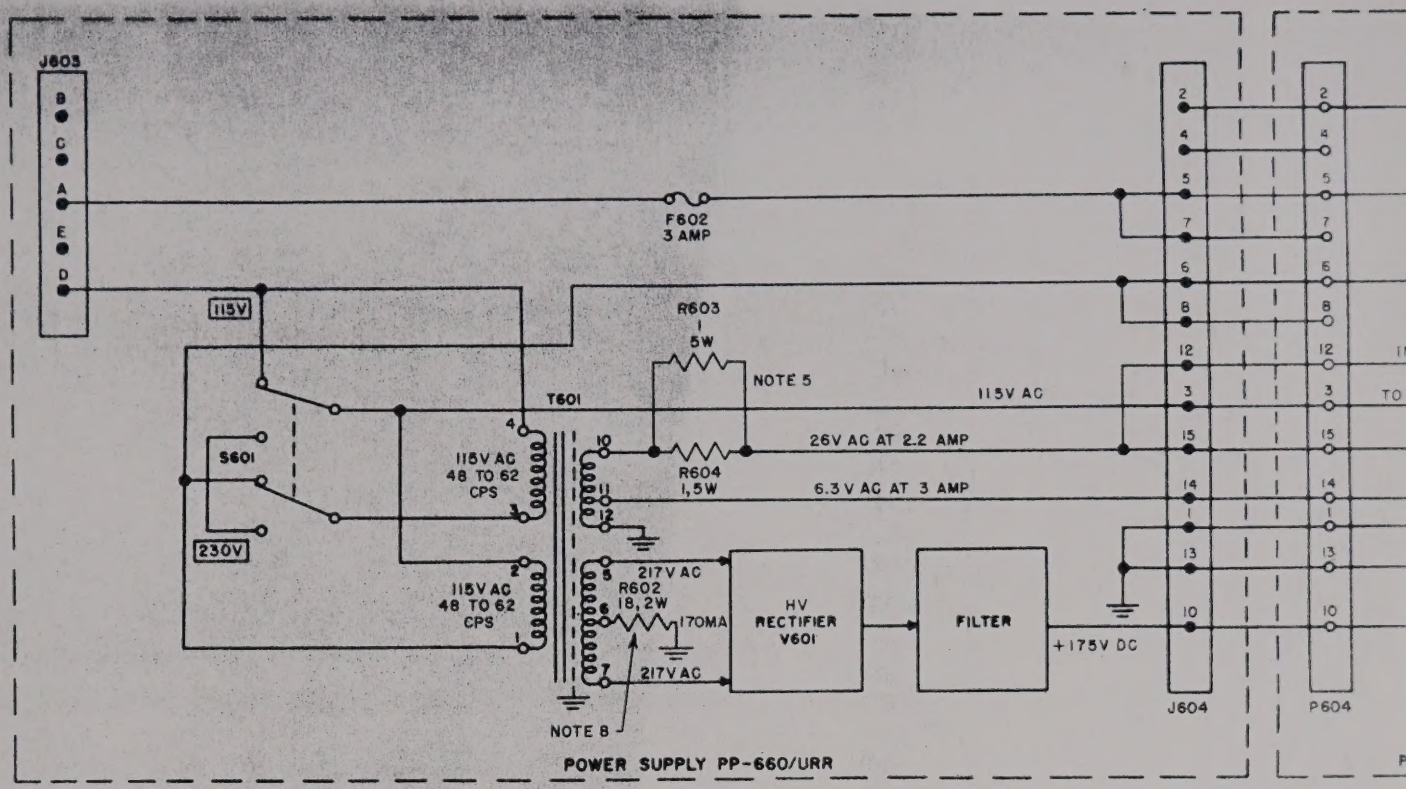
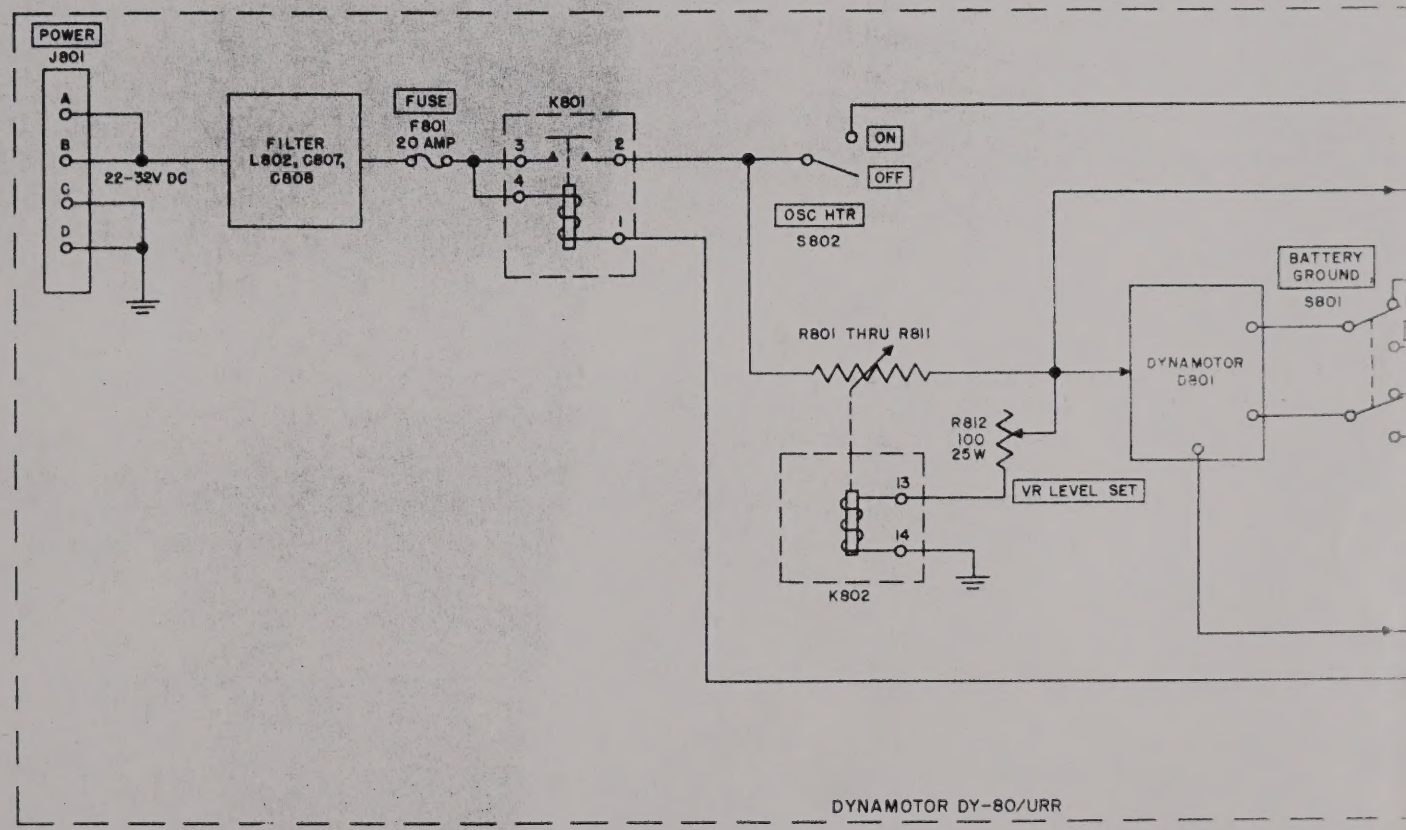


Figure 121. Cabling and power distribution.


J603
B
C
A
E
D
F602
3 AMP
115V
S601
230V
T601
115V AC
48 TO 62
CPS
115V AC
48 TO 62
CPS
R603
1
5W
NOTE 5
R604
1,5W
R602
18, 2W
170MA
217V AC
217V AC
NOTE 8
HV
RECTIFIER
V601
FILTER
+175V DC
115V AC
26V AC AT 2.2 AMP
6.3 V AC AT 3 AMP
J604
P604
TO
POWER SUPPLY PP-660/URR


POWER
J801
A
B
C
D
22-32V DC
FILTER
L802, C807,
C808
FUSE
F801
20 AMP
K801
ON
OFF
OSC HTR
S802
BATTERY
GROUND
S801
R801 THRU R811
DYNAMOTOR
DB01
R812
100
25W
VR LEVEL SET
K802
DYNAMOTOR DY-80/URR